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## ACCOUNTING METHODS FOR DETERMINING COSTS AND PRICES

WILLIAM MORSE COLE

Those who are trying to develop the comparatively new science of accounting are placed in a position unlike that of almost any pioneers who have preceded them—if not in kind, at least in degree. They are facing in extreme form the sort of thing that economists in general have long suffered. For many years economists were rather laughed at by business men because they were giving strange uses to old words or seeking peculiar visual angles for the observation of common transactions. With this you are all familiar. Only those who are specially engaged in the consideration of accounting, however, realize in what a high degree this is true of the accounting branch of economics. In this branch the professional man (and by this term I mean both the practitioner and the teacher) is using not only the common terms of business but also the detailed paraphernalia of forms of record, and yet he is forced commonly to recommend that they be put to uses that violate the traditions of generations and generations of competent or quasi-competent and altogether respectable bookkeepers. The business man does not object to economic theories as such, nor always to the application of those economic theories in public affairs, but when these theories knock at the door of his own counting room, and bring with them a reputation that leads the bookkeeper to say, "If you let them in, you and I will have to go to school again and learn a new language", he is inclined to shrug his shoulders and say, "Go away, little boy, go away!" His attitude toward the little boy is natural enough—and the epithet "little boy" is not altogether bad. Accounting is a little boy—he is far from maturity; but he is a stalwart youngster, and he has already done a great deal for those who have trusted him with a job. Undoubtedly for many years the so-called practical business man will laugh good-naturedly at much that the professional accountants advocate, and the more conservative accountants will laugh at much of what the more venturesome will practice. The test will lie always in the results—where men can be found bold enough to forget tradition and try results—but it takes a long time to get the community into a frame of mind receptive enough

to test the results fairly. One thing is obvious: for an accountant to install for his client a system of accounting that the client does not trust is practically to foredoom the experiment to failure. The client must see the value of what is recommended; and he must see the economic principle underlying the accounting system, or he will not see the value of the system as a whole. To get the accounts of the business of this country put upon a sound basis means the education of the public to something of an appreciation of fundamental economic principles.

We who are here are supposed to be without the prejudice of tradition—we are supposed to be open-minded enough to welcome any new thing that can justify itself both rationally and practically—whether it violates tradition or not. I am going to ask you therefore to forget what has customarily been done with regard to the determination of costs, and to consider the subject independently of tradition. Then when we have considered what is desired, we may see how far the traditional methods may be used to produce the thing desired. If we can get the thing we want without much disturbance of tradition, so much the better.

In the first place, I wish to premise that business is not always profit-making or even intended to be profit-making. Many large and valuable enterprises are concerned solely with product; they not only seek no profit, but they distinctly wish to avoid profit. They are concerned only to get the maximum product at the minimum cost. The number of such enterprises is continually increasing. It is futile to deny that these are business enterprises, for they seek to produce definite results through the employment of paid human agencies; and I conceive that element, bargain and sale relations between human elements, to make the distinction between business and other things, mere handicraft on one hand, and mere physical and mental activity on the other. No accounting is adequate unless it is based on the fundamental fact that costs have in them no element of profit for the enterprise concerned. If profit is in the enterprise, the profit is an amount over and above the cost, and the cost must as clearly exclude any element of profit for the enterprise as if the enterprise were concerned solely with product and sought to avoid profit. We may say, indeed, that accounting is concerned with the economics of consumption quite as much as with those of production; and no accounting is adequate which tries, figuratively speaking, to treat them both as if they were opposite sides of the same account—and

therefore presents what looks like a balance between them as if that were the final figure desired.

My second premise is this: With the determination of how much absolutely is a fair profit, accounting has nothing to do; but the facts upon which the fairness of profit hinges must be shown by the accounts just as far as those facts are capable of expression in figures. Let me illustrate: Whether interest shall be 6 per cent or 4 per cent, whether wages shall be \$5 a day or \$2, whether rent shall be \$5 an acre or \$1 a foot, is not a question for accounting to settle; but to discover all the figures that can be known as material for determining the fair rate of interest, of wages, and of rent, is the accountant's particular task. The final decision may involve important considerations of risk, of social desirability, of spiritual progress, that cannot be recorded in accounts. This is so obvious that you may wonder at my mention of it. I do it only because I find often that it is neglected in practice. In other words, the temptation is strong to try to strike a balance between the economics of consumption and those of production, and show a result which is neither—and therefore worthless for the purposes of either. For illustration, if in some municipal activity allowance for social value has been allowed to creep into a figure of cost (let me say a disregard of some fact in distribution of costs because the social value of the service is deemed to offset an actual outgo), the result may be satisfactory for the purposes of that particular calculation, and yet be seriously misleading when the figure is used for purposes of comparison in another connection or as the basis for a new figure where the social value of the service is not a factor of the same weight.

From these two premises that I have made—first, that accounting *is* concerned with *all business*, in the largest sense of the word, and, second, that accounting is *not* concerned with questions of policy but only with questions of fact (facts which justify policy or are the results of policy)—comes my fundamental thesis, that the proper function of accounting is nothing more or less than telling the truth, telling the economic truth, and telling it in such fashion that the known facts shall not be held in solution, so to speak, in a lot of supposed facts, estimated facts, and *quasi* facts. It is obvious that many figures in accounting are bound to be estimates—as allowances for depreciation, debts that will prove uncollectible, valuations of property owned, demands on contingent liability, etc.; but it is equally obvious that these estimated

figures may be shown in their true character—as the results of estimates, with the bases on which they were deduced—and that they need not be combined with known items so as to hide the identity of the known items and put the combination into the category of estimated items. In other words, the method of accounting should be the general method of science—expressed in the precept “So far as possible, isolate your causes, and distinguish your results.” A physicist who should conduct all his experiments regardless of atmosphere and temperature would learn nothing of natural law. An accountant who constantly and unnecessarily combines known and unknown quantities gets results that tell little about business operations; he certainly is contributing nothing to the advance of economic knowledge.

Let us now examine the application of some fundamental economic principles to accounting, and see what they suggest in the way of accounting facts and methods. It is clear that here, at least, abstruse and somewhat disputed refinements of economic theory can have no place; for, however advantageous it might be to put certain of such theories to the practical test of operations and accounting record, such experiments are available only where a business enterprise is offered as a voluntary laboratory; we could hardly recommend that sort of thing as general accounting policy.

The subject of our discussion this evening, as indicated by the program, is a method of determining costs and of using those costs as criteria for fixing prices. Whether the prices are to yield a profit or not does not concern us here; for even if they are to do so, the amount is to be determined by the application of some ratio or formula to the cost already found. Let us begin our application of these principles with interest on capital invested.

On this matter of what is a fair return for capital invested, all communities are much divided; but if my fundamental thesis is accepted, this does not much concern the accountant. He is not—that is, as an accountant—concerned with policies, but with facts. It is his business to record what has happened, and to do it in such fashion that every one may for himself determine what he thinks ought to happen. If the accountant bases his figures on his own theory of what ought to happen—for example, in the matter of payment of dividends—his figures are of practically no use to anyone who has a different theory; indeed, the accountant's figures are of little use even to the people whose theory is identical

with his own, for unless he has informed them as to the theory that underlay his figures, they know nothing as to what those figures really mean. Let us take a concrete case. A company has inaugurated a new business which is slow in development. For the first year it does not pay, for it has not yet developed its following or created a sufficiently large demand for its product. The books show a deficit. At the end of the second year, the condition is improved, but though there is every prospect of success not only ultimately but even in the coming year sufficient to wipe out the deficit, the net result of the two years is still a deficit. The accountant decides that this deficit is really an organization expense; indeed, that the full first year's deficit is an organization expense; and that the real result of the two years' operations is a profit, for the amount sunk in the first year is permanent investment, akin to payment for good will. He even goes so far as to say that interest on that first year's deficit should be met out of the product and should be charged as a cost—exactly like interest on funds locked up in machinery. He will say in future years that no profit is shown until enough has been deducted from product to pay interest on this year's deficit. In other words, he will have capitalized this deficit. There are logical grounds for such a view. When, however, we in later years make a study of dividends of this company, and find that none were paid in this first year, we naturally think that a fair return on the investment has not been made unless the later years have paid enough to offset the loss in that first year. Unless we learn that this deficit was capitalized, and that in later years interest has been paid on this capitalized deficit before net profits were deduced, we never appreciate what has happened. The accounts are figures plus a point of view; and the reader of the figures does not know which is which. The accountant, as an accountant, should have no visual angle. He should always face front. Our real problem is to learn what are the focal points on which the face-front accountant should fix his attention and to which he should relate all the facts.

With regard to interest on capital, which we have just been considering, we are forced to observe, as a practical application of our principle of isolating causes, that ordinary interest is made up largely of return for risk assumed. That, of course, is the really variable element in most interest rates. Accounting that disregards it is by so much failing to tell what it might of business

conditions and of the affairs of any particular business. It is easy to say that the gross interest rate is good enough for practical purposes, and that one interested in the risk element can easily deduct a minimum rate, for the true interest rate, and use the residue as the compensation for risk. That would be true if interest were always a final figure, or were always a coefficient. As a matter of fact, however, the interest rate is likely, mathematically speaking, to turn up anywhere in an equation—as a coefficient, as a divisor, as a power, as a root. Every time it turns up anywhere except as a final figure its weight is affected. Let us take as an illustration a case in which profit is sought. In our cost of manufacture we usually consider interest on machinery employed in processes as a part of the cost of the product. This is necessary if we are to distribute costs properly between different articles of product and fix prices accordingly. The selling price is usually determined by adding to the final figure for cost a figure for profit; and this profit must include not only interest at the minimum rate on the investment in the business as a whole, but also an element for risk. If the interest rate used in figuring the manufacturing cost—that is, interest on the cost of machinery—is at a normal market rate, it includes the element of risk; and the element is also included in the allowance for risk to be added, as a final figure, to the manufacturing cost. If the plan is well worked out, this risk element will not get in twice; but precaution must in any case be taken, and the precaution cannot be taken by general principle but must be by constant adjustment, for any change in the conditions—that is, in the place that the normal interest occupies in the equation—necessitates a new adjustment. If most of the property of the business is in a manufacturing plant, it would be true, assuming the normal interest rate to be used for figuring cost on machinery employed, that the return for risk which the company would have to earn on its investment would be practically all provided for in its manufacturing cost, and very little would need to be added, as a final figure, for risk included in profit; but if little of the property were so invested, a good deal must be added for risk. This gives a curious conclusion. If your property is in machinery, your risk is counted as cost, not as an element of profit; if your property is not in machinery, risk is counted as profits and not as cost. Surely there is no adequate accounting when the visual angle turns cost into profit. This illustrates what I mean by sug-

gesting the need of the front-face. What does clearness require to be shown with regard to one's own property used in one's own business?

It seems rather foolish to attach certain risks to manufacturing costs and then neglect others, no less connected with manufacturing, until the final figures are sought. No one thinks, for instance, of charging probable losses from bad debts to the cost of manufacturing the articles that will be ultimately sold for the bad debts, or of increasing the recorded cost of goods sold because of the practically certain loss on some goods remaining unsold. The fact is that the risk element of interest should be considered only as a final figure—not a manufacturing cost, but a return of the business as a whole, to make good in good years the evil chances of the lean years. When we have any consideration of interest as a factor within the business—that is, as cost—we are properly concerned only with that which is pure interest—roughly speaking, the lowest rate at which money is ever lent where the risk is negligible, say 2 per cent. (The exact rate is not here of consequence. I desire merely a pure interest rate that eliminates the variable element.) It is true that if your general risks are provided for in your final figure, the only actual known cost to you of using money in your business is, roughly, that 2 per cent; for if you lend it on anything else than the absolute security of a sound government and get more than 2 per cent you are assuming certain risks. To put this in another way, we may say that if all your property is invested in manufacturing plant and you charge in manufacturing costs an interest rate on machinery high enough to cover the risk on your investment, you do not need to add a risk element in the profit portion of your price, for you have already covered the risk in your manufacturing rate; conversely, if you have included in the profit portion of your price a proper risk element, you need to charge only pure interest (say 2 per cent) in the cost portion of your price. Practically, and for any particular case, it makes no difference where your risk element goes; but the moment you attempt to make comparisons of cost where conditions are dissimilar the difference in visual angle makes futile any attempt to make things coincide. Here is a case, then, in which only the application of a theoretical economic principle gives the front-face that enables accounts to tell the exact truth. We hear much of the desirability of uniform accounting. There can be no uniform



accounting without similarity of visual angle—or, better, exact front-face. In this matter of interest costs within the enterprise, the approximate pure interest rate is the only fixed element. The judgment of risk is dependent always on the personal equation; and so it should be a final figure to be floated on top of the known figures, so to speak, and not be lost in a combination, or an aqueous solution which is neither one thing nor another. When interest is charged against a department of a business for machinery or other property used by it, that interest might well be carried to an account by itself; for since it represents pure interest it should not be combined with the commercial interest paid and received in ordinary transactions.

Mr. Dickinson and I, you see, are in perfect agreement as to what we want—namely, isolation of causes; but the line of cleavage between causes we are inclined to draw differently. Mr. Dickinson, conceiving profit to be a certain surplus divisible between all three of the agents of production—labor, land, and capital—wishes to exclude all interest from cost; while I, conceiving profit to be only what is left after rent, pure interest, and wages have been paid—that is, virtually the compensation for risks taken—wish pure interest, and pure interest only, to count as a cost. Many accountants count as cost all interest on investment, including all risk elements.

I am aware, of course, that many persons will deny that there is any such thing as pure interest, or that it is sufficiently uniform to serve the use that I am arguing for. In answer I can only say here that I am satisfied that the variations in interest rate are due either to known actual risk or to supposed risk; and for our purposes—since the rate of interest is fundamentally affected by psychological elements—there is no difference between known risk and imagined risk. We may substitute the term “effective risk” for either. The so-called friction in the flow of capital, allowing higher rates in one locality than in another equally safe for the investment of capital, is nothing but the registration of effective risk.

If in any business enterprise new money must be borrowed to install new machinery, and credit is just now so bad that a high rate must be paid, it is absurd to allow that bad credit to go as a cost (as interest on manufacturing plant used) in the manufacture of particular articles of product; for if that is done, an improvement of credit will apparently lower the cost of produc-

tion: and yet credit has nothing to do with *manufacturing* processes. Even though high interest is actually paid, the risk element in that payment should be counted not as a cost, but as a deduction from profits; that is, the final figure of profits at the end of the earning period will be reduced because the enterprise has borne only a part of its risks, and has hired others (through a high interest payment) to bear some of those risks for it.

As Mr. Dickinson has well pointed out, if interest is allowed to count as a cost, it counts more largely when material is purchased partly or wholly manufactured than when only raw material is used. This does not seem to me objectionable. We are primarily seeking costs for the enterprise immediately concerned. If what is cost to it includes the profits for another enterprise, its costs will be (other things equal) inevitably greater. The accounts should show them so. We are, moreover, seeking also comparative costs; then, surely, we wish costs under conditions involving some one's else profits to show greater than under conditions where no profits are involved until the end. We wish causes isolated so far as possible. The plan that I suggest seems to me to provide such isolation.

When we come to consider the rate of return to capital in an enterprise as a whole, we may find an account for pure interest to be worth while for a single proprietorship or for a partnership, but it is hardly likely to be serviceable for a corporation. The income to the business as a whole from pure interest charged to departments should be credited to Profit and Loss in the usual way, and then the final net income will be compared with the amount on which the enterprise should earn profits. Whether these profits are fair is a question not for the accountant but for personal or judicial opinion. It involves the visual angle. What information can the accountant give that will serve for the front-face, so that men with visual angles shall know how to read the figures and allow for their own foreshortenings and perspectives? I conceive that in this matter of capital investments there is but one front-face. Any other point of view at once introduces a matter about which there can be honest difference of opinion. One man says rates should be lower because the people have created the value of what the company is utilizing. Only if the accounts show what the owners have actually put in, or left in of their earnings, can anyone tell whether the public did create the value—and even then it is in large part a matter of judgment; but

without the figures the judgment has nothing to work on. Another man says that rates should be higher because they do not yield a proper return on the valuation of the property. Yet if the property is the creation of the public and not of the titular owners, the valuation has nothing to do with the justice of the rates; and only accounting for actual investment or virtual reinvestment can tell anything about the real source of the property. A third man says that rates should be lowered because the property could be duplicated for a sum so small that much less than the present rate would pay a fair return on the investment. Yet most of us believe that the return to an enterprise socially serviceable should be not an equivalent of fair interest on what one could now establish it for, after someone else has taken the risks, conducted the experiments, and learned the way, but on the actual cost of the enterprise with compensation for the risks taken. The point here, however, is not that one or another of these points of view is right, but that no common ground exists on which they can be argued except the ground of what has actually happened. The accountant is the scientist who shows the facts, and the prime fact is the actual history of where the property came from and where its product has gone. Then if the community wishes to take the unearned increment, the accountant, as an accountant, has nothing to say; if it wishes to allow men very high return for risks which they have taken, as an accountant he is not concerned; if it wishes to play the game of "heads I win, tails you lose", he again, as an accountant, is not interested. He should keep his accounts, moreover, with an eye single to the truth and not allow himself as an advocate to color the facts with his theories of social justice. Not until the accountant realizes that he is a scientist, and that his work is the discovery of impartial fact, will the public have at its disposal the facts that will enable it to apply its notions of policy with eyes open. To fear the truth is the depth of cowardice, or knavery.

What is the actual investment in a property? As suggested by the supposititious case that I cited earlier in this paper, from one point of view investments may be deficits as well as original sacrifice—when one realizes that operations which establish future producing power and are paid for out of product are taken from the pockets of the owners. Exactly akin is depreciation suffered and not made good—when the product is not enough to make it good. In both cases the cost or sacrifice has been

incurred—and that is usually what we mean by investment. Unless we know what has been the actual cost or sacrifice, including risk, we cannot know whether the compensation is adequate or not. That is why I am arguing for the preservation on the books of actual sacrificial cost (if I may use the word in that sense), as distinguished from any combination of that cost with risk elements, valuation elements, duplication elements. We do not want nondescript combinations of figures. We want isolated causes.

Now allow me to suggest how these sacrificial costs may be preserved free from entanglement. In the first place, though I have suggested that depreciation not made good out of product is a sacrifice and a cost, it should be clearly shown for what it is. Some persons might suggest that as I call it sacrifice, not only when invested but afterwards when worn out, I should neglect to note the depreciation and therefore let my original investment in the plant remain on the books at original cost. It is true that for a going concern I recommend cost rather than valuation as the asset figure; but truth demands that the cost figure shall be the present cost figure and by that I mean the original cost figure revised with regard to the facts that have concerned it. If, for instance, a machine has depreciated one fourth—through either use or obsolescence—with respect to the purpose for which it was originally bought, the purpose of the original sacrifice has so far been served, and its present cost is but three fourths of its original cost. In spite, therefore, of the theory that cost and not valuation is the true basis for the accounts, the asset must be written down. To base the accounting on costs rather than on valuations does not in the least confuse capital and revenue. Any judgment as to the fairness of rates or prices or profits must be based on a recognition of both capital and revenue. The front-face accounting will either show directly or give a basis for both of these; first, the original capital costs, plus new investments and reinvestment of profits, less consumption of capital assets; second, the actual profits and the distributed profits. From these figures every competent judge can see for himself, with his own visual angle, whether the profit derived is fair—taking into account those elements of risk, social service, etc., which apply to the particular case. The moment any elements of risk, capitalized earning capacity, cost of duplication, or selling valuation, get into the accounts of a going con-

cern the front-face view has been lost and no one knows just what the figures mean.

My general principle I have illustrated rather fully with the case of interest on capital. I wish to add just a word on rent, for I am not ready to adopt Mr. Dickinson's point of view. Many accountants say that rent is a profit, not a cost. This seems to me a perversion of the economic doctrine that rent does not add to the cost of production. Laying aside refinements of economic theory and taking things in the rough, the natural cost of an article is the cost at the margin of production—the cost at which it just pays. If rent is paid, however, a countervailing advantage must somewhere exist else the work should not be done. Then the costs exclusive of rent are below the margin, or standard. To fix prices at that point is to transfer the benefit of the advantage to the customer and sell goods at a point so low that it cannot persist. The accounts, in other words, have led to a false conclusion with regard to normal cost. The rent, which merely measures the amount by which the *particular* articles are produced *below* the margin, is in this case an element in the measure of *standard* cost, and so should be included in the cost calculations. If the manufacturers are owners of the real estate, rent to them is an income not as manufacturers but as real estate owners. If they pay rent to others, rent is to them a clear cost and should be so reported. I have been speaking, of course, of economic rent, as distinguished from mere interest on the money invested in improvements. The interest portion of rent is subject to the considerations which we have already made.

You will note that I have not attempted to discuss the detailed application of these matters to particular processes. I have thought it well, at least for the sake of variety, to devote my discussion to some very fundamental matters, upon which, if we can once come to an agreement, anything approaching uniformity of accounting methods must be based. Nothing like standard units of cost can ever be learned while fundamentals are treated differently.